

Montana State University REU and RET Program in Materials Research

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Activities During The 10-Week Program

- Weekly research seminars given by MSU faculty.
- General interest seminars for all summer program participants at MSU.
- Daily work in the laboratory on projects assigned specifically to the participants.
- Instruction on presenting a scientific paper.
- Final 30 minute research presentations by participants.
- Social activities integrated with the MSU Solar Physics REU program.
- Picnic for the participants in all summer programs at Montana State University (Over 120 people in 2004).



State of the Art Research Facilities

Undergraduate Brian Myer (Appalachian State University) observing the growth of a single crystal for his project investigating magnetocaloric effects in manganese oxides. Pictured is MSU's Optical Image Furnace (DMR0315809) during growth of $\text{La}_{0.82}\text{Sr}_{0.18}\text{MnO}_3$.



White Water Rafting - REU students on the Yellowstone River near Gardiner, MT, Saturday, July 10th, 2004.

The 10-week summer program provides each student and teacher participant with their own research project. They are closely monitored in the first few weeks to make sure they are making progress on their research. During the final week of the program, the students prepare a powerpoint presentation of their work in a day-long meeting of all condensed matter REU and RET participants. In 2004 two participants from the summer of 2003 presented their work at the APS March Meeting in Montreal.

Weekly seminars, geared for undergraduates, are given by MSU physics department members to introduce the students to a wide range of research. During the summer some general interest seminars are given as well; for example, a seminar on the magnetism of the sun, a seminar ethics in education, and a seminar from the Montana Forensics Department were offered.

We organize a number of weekend social activities together with the MSU Solar Physics REU Program. In 2004 these included a welcome party, two hiking trips, a day of whitewater rafting on the Yellowstone River, and a farewell barbecue. The office of summer programs at MSU organizes a picnic for all summer program participants (over 120 people in 2004) so students from various programs can meet one another.

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Some of the Research Projects in 2004

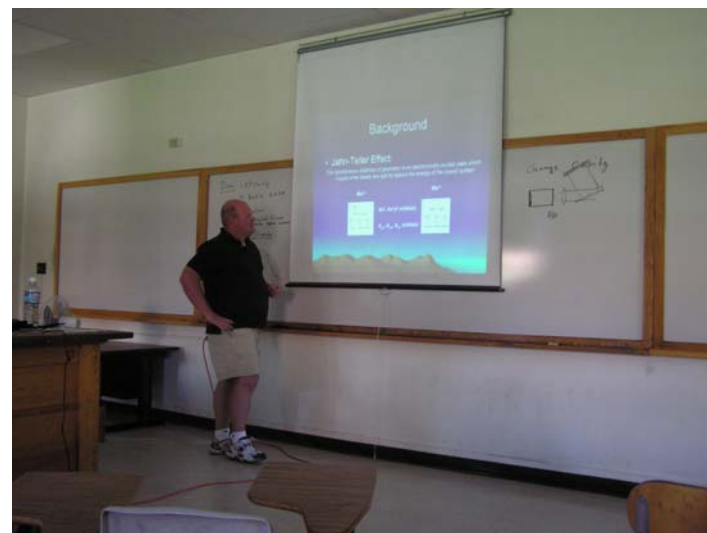
Atomic Force Biosensors: Detection and characterization of single molecule antibody-antigen interactions via atomic force microscopy, Scott Randall, University of Washington, Seattle, (Advisor: Recep Avci).

Comparing the magnetocaloric effect in single crystal and polycrystal $La_{1-x}Sr_xMnO_3$, Brian Myer, Appalachian State University, (Advisor: John Neumeier).

Measuring Anisotropy With the Surface Magneto-optic Kerr Effect, Kyle Story, Cornell University, (Advisor: Yves Idzerda).

Synthesis and Examination of Rare-Earth, Cerium-Doped Orthochromites and High School Physics Curriculum Development, Buck Marsh, RET Participant, East Valley High School, Yakima, WA, (Advisor: John Neumeier).

High Temperature Impedance Spectroscopy System for Solid Oxide Fuel Cell Ceramics, Arnold Braker, University of Oklahoma, (Advisor: Hugo Schmidt).



Research Presentations

RET Participant Buck Marsh (East Valley High School, Yakima, WA) Presents the results of his summer Research project on Friday, August 13, 2004.